

Docket No: JEANJEAN
 Appl. No: 10/510,115

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AMENDMENTS TO THE CLAIMS WITH MARKINGS TO SHOW CHANGES MADE, AND LISTING OF ALL CLAIMS WITH PROPER IDENTIFIERS

1. (Currently amended) A hydraulic device for back and forth movement as well as locking of a machine part, in particular for opening, closing and clamping ~~[[the]]~~ half-molds of an injection molding tool of an injection molding machine, comprising:
 - a cylinder ~~[[(1) in which]]~~ having a first pressure space ~~[[(6)]]~~ with a pressure medium ~~[[is provided.]]~~;
 - a ~~[[first piston (1)]]~~primary piston~~[[(2)]]~~ (2), wherein the primary piston (2) which includes at least one ~~[[or more]]~~ piston ~~[[rods (11) and can]]~~ rod constructed to float in the pressure medium ~~[[located]]~~ in the first pressure space ~~[[(6)]]~~; and
 - a ~~[[second piston (1)]]~~secondary piston~~[[(7)]]~~ (7) axially movable in the cylinder ~~[[(1), wherein the secondary piston (7) has]]~~ and having a ~~[[recesses]]~~ recess in which the piston ~~[[rods (11)]]~~ rod of the primary piston ~~[[(2) are]]~~ is movable, ~~[[and that the]]~~ said primary and secondary pistons having opposing sides ~~[[of the primary piston (2) and secondary piston (7) have]]~~ to define confronting contact surfaces ~~[[(40, 41)]]~~ which can be brought to impact one another.
2. (Currently amended) The hydraulic device of claim 1, wherein the opposing sides of the primary ~~[[piston (2)]]~~ and secondary ~~[[piston (7)]]~~ pistons are so configured as to form a second pressure space ~~[[(43)]]~~, when the contact surfaces ~~[[(40, 41)]]~~ between the primary piston ~~[[(2)]]~~ and secondary piston ~~[[(7)]]~~ touch one another, and ~~[[that]]~~ further comprising a passageway ~~[[(29)]]~~ which feeds into ~~[[this]]~~ the second pressure space ~~[[(43)]]~~ and is provided for decompressing the pressure medium trapped in ~~[[this]]~~ the second pressure space ~~[[(43)]]~~.

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3. (Currently amended) The hydraulic device of claim 2, ~~[[wherein]]~~ and further comprising means for generating a negative pressure ~~can be generated~~ in the second pressure space ~~[[43]]~~ formed between the primary piston (2) and secondary piston (7)].
4. (Currently amended) The hydraulic device of ~~[[one of the claims 1 to 3]]~~ claim 1, wherein the contact surface ~~[[40]]~~ of the primary piston ~~[[2]]~~ and the contact surface ~~[[41]]~~ of the secondary piston ~~[[7]]~~ are conical.
5. (Currently amended) The hydraulic device of ~~[[one of the claims 1 to 4]]~~ claim 1, wherein the secondary piston ~~[[7]]~~ has a first section ~~[[8]]~~ sliding on the an inner wall of the cylinder ~~[[1]]~~ and demarcating the first pressure space ~~[[6]]~~ on ~~[[its]]~~ a side ~~[[21]]~~ facing the primary piston ~~[[2]]~~, ~~[[and that the]]~~ said secondary piston ~~[[7]]~~ further ~~[[includes]]~~ including a second section ~~[[9]]~~ extending in prolongation of the first section ~~[[8]]~~ and having a diameter which is smaller than ~~[[the]]~~ an inner diameter of the cylinder ~~[[1 in this area]]~~ so that a third pressure space ~~[[10]]~~ in the form of an annular gap is defined between the cylinder ~~[[1]]~~ and the secondary piston ~~[[7]]~~.
6. (Currently amended) The hydraulic device of ~~[[one of the claims 1 to 5]]~~ claim 1, wherein the cylinder ~~[[1]]~~ has a first section ~~[[37]]~~ with a first inner diameter ~~[[4]]~~ and a second section ~~[[38]]~~ with a second inner diameter ~~[[39]]~~, ~~[[that the]]~~ wherein a region passed by the secondary piston ~~[[7]]~~ during its movement is located within the second section ~~[[38]]~~, and ~~[[that]]~~ wherein only the second section ~~[[38]]~~ has a surface to satisfy hydraulic requirements.
7. (Currently amended) The hydraulic device of ~~[[one of the claims 1 to 6]]~~ claim 5, wherein the second section ~~[[9]]~~ of the secondary piston ~~[[7]]~~ partly projects beyond the cylinder ~~[[1]]~~.

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8. (Currently amended) The hydraulic device of [[one of the claims 1 to 7]] claim 1, wherein the piston rod ~~[[11]]~~ of the primary piston ~~[[2]]~~ has a first section ~~[[13]]~~ which slides in the recess ~~[[12]]~~, ~~[[that the]]~~ said piston rod ~~[[11]]~~ further ~~[[includes]]~~ including a second section ~~[[14]]~~ extending in prolongation of the first section ~~[[13]]~~ and having a smaller diameter than the first section ~~[[13]]~~ so that a fourth pressure space ~~[[18]]~~ in the form of an annular gap is defined between the second section ~~[[14]]~~ of the piston rod ~~[[11]]~~ and the secondary piston ~~[[7]]~~, ~~[[and that]]~~ wherein the second section ~~[[14]]~~ is guided through a bore ~~[[15]]~~ on ~~[[the]]~~ a tool-side end of the recess ~~[[12]]~~ of the secondary piston ~~[[7]]~~.
9. (Currently amended) The hydraulic device of [[one of the claims 1 to 8]] claim 1, wherein the cylinder ~~[[1]]~~ has an end which faces ~~[[the]]~~ a moving platen ~~[[machine part (16)]]~~ of a three-platen clamping unit of an injection molding machine and has an end piece ~~[[17]]~~ which is configured as support platen of ~~[[a]]~~ the three-platen clamping unit ~~of an injection molding machine~~, ~~[[and that the]]~~ said piston rod ~~[[11, 14]]~~ is being securable to the moving platen ~~[[16]]~~ of this clamping unit].
10. (Currently amended) The hydraulic device of [[one of the claims 1 to 8]] claim 1, wherein the primary piston ~~[[2]]~~ has a side which is distal to the secondary piston ~~[[7]]~~ and has a further piston rod ~~[[46]]~~ defined by a diameter which is smaller than ~~[[the]]~~ a diameter of the first piston rod ~~[[11]]~~, ~~and that the~~ said further piston rod ~~[[46]]~~ projects projecting beyond the cylinder ~~[[1]]~~.

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11. (Currently amended) The hydraulic device of claim 10, wherein the cylinder ~~[[(1)]]~~ has an end which faces ~~[[the]]~~ an injection molding tool ~~[[(24, 42)]]~~ and has an end piece ~~[[(17)]]~~ which is configured as a platen of a two-platen clamping unit of an injection molding machine, ~~[[and that the]]~~ said further piston rod ~~[[(43) is]]~~ being securable to ~~[[the other]]~~ another platen of the two-platen clamping unit.
12. (Currently amended) ~~[[Clamping]]~~ A clamping unit for an injection molding machine, comprising:
- a support platen ~~[[(17),]]~~;
 - a fixed platen ~~[[(44)]]~~; ~~[[and]]~~
 - a moving ~~[[(46)]]~~ platen~~[[.]]~~ ~~as well as one or more and~~
 - a hydraulic devices according to one of the claims 1 to 9 device for operating the moving platen ~~[[(16)]]~~, said hydraulic device including a cylinder having a first pressure space with a pressure medium, a primary piston which includes at least one piston rod constructed to float in the pressure medium in the first pressure space, and a secondary piston axially movable in the cylinder and having a recess in which the piston rod of the primary piston is movable, said primary and secondary pistons having opposing sides to define confronting contact surfaces which can be brought to impact one another.

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13. (Currently amended) [[Clamping]] The clamping unit ~~[[for an injection molding machine]]~~ of claim 12, comprising a support platen (17), a fixed (44) and a moving (13) platen, as well as one or more hydraulic devices according to one of the claims 5 to 9, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, wherein the cylinder [(1)] is secured to the support platen [(17)], or an end piece of the cylinder [(1)] is configured as support platen [(17)], wherein the support platen [(17)] has bores [(55) through which] for passage of the secondary piston [(7) can travel], wherein the piston rod [(11)] is mounted to the moving platen [(16)], and wherein the further pressure space [(10)] can be hydraulically blocked during [the] closing and opening movements of an injection molding tool of the injection molding machine.
14. (Currently amended) [[Clamping]] The clamping unit ~~for an injection molding machine of claim 12, comprising a support platen (17), a fixed (44) and a moving (13) platen, as well as one or more hydraulic devices according to one of the claims 1 to 9, wherein the cylinder [(1)] is secured to the support platen [(17)], or an end piece of the cylinder [(1)] is configured as support platen [(17)], wherein the support platen [(17)] has bores [(55) through which] for passage of the secondary piston [(7) can travel], wherein the piston rod [(11)] is mounted to the moving platen (16), and [wherein] further comprising at least one auxiliary cylinder [(56) is/are] provided on the support platen [(17) and/or on] or the fixed platen [(44) whose] and having a piston [rod(s) (57) is/are] rod mounted to the moving platen [(16)].~~

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15. (Currently amended) The clamping unit of claim 14, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, said [[the]] first pressure space [(6) is] being hydraulically blockable for the closing movement of an injection molding tool of the injection molding machine, and said [[the]] further pressure space [(10) is] being connectable to a pressure medium source [(27) and] while the auxiliary cylinder [(56) can be]] [is idle.
16. (Currently amended) The clamping unit of claim 14, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, said [[the]] first pressure space [(6) is] being hydraulically blockable for [[the]] a closing movement of an injection molding tool of the injection molding machine, and wherein the auxiliary cylinder [(56)] as well as the further pressure space [(10)] are connectable to a pressure medium source [(27)].

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17. (Currently amended) The clamping unit of [[one of the claims 14 to 16, with]] claim 14, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, wherein the auxiliary cylinder [[56]] has first and second auxiliary pressure spaces and is provided on the support platen [[17]], wherein the first pressure space [[6]] is hydraulically blockable for [[the]] an opening movement of an injection molding tool of the injection molding machine, wherein the further pressure space [[10]] as well as the first auxiliary pressure space [[59]] in the auxiliary cylinder [[56]] are hydraulically relieved, and the second auxiliary pressure space [[60]] in the auxiliary cylinder [[56]] is connectable to a pressure medium source [[27]].
18. (Currently amended) The clamping unit of [[one of the claims 14 to 16, with]] claim 14, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, wherein the auxiliary cylinder [[56']] has first and second auxiliary pressure spaces and is provided on the fixed platen [[44]], wherein the first pressure space [[6]] is hydraulically blockable for [[the]] an opening movement of an injection molding tool of the injection molding machine, wherein the further pressure space [[10]] as well as the first auxiliary pressure space [[60']] in the auxiliary cylinder [[56']] are hydraulically relieved, and the first auxiliary pressure space [[59']] in the auxiliary cylinder [[56']] is connectable to a pressure medium source [[27]].

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19. (Currently amended) ~~[[Clamping]] The clamping unit for a two-platen injection molding machine, comprising a fixed ~~[[44]]~~ and a moving ~~[[16]]~~ platen as well as one or more hydraulic devices according to claim 10 and 11 for operating the moving platen ~~(16)~~ of claim 28~~, wherein the cylinder ~~[[1]]~~ is mounted to the fixed platen ~~[[44]]~~, or an end piece of the cylinder ~~[[1]]~~ is configured as fixed platen ~~[[44]]~~, and wherein the second piston rod ~~[[46]]~~ is guided through the fixed platen ~~[[44]]~~ and attached to the moving platen ~~[[16]]~~.
20. (Currently amended) ~~[[Clamping]] The clamping unit for a two-platen injection molding machine, comprising a fixed (44) and a moving (16) platen as well as one or more hydraulic devices according to claim 10 and 11 for operating the moving platen (16) of claim 28~~, wherein the cylinder (1) is mounted to the moving platen (44) or an end piece of the cylinder (1) is configured as moving platen (44), and wherein the second piston rod (46) is guided through the moving platen ~~[[44]]~~ and attached to the fixed platen ~~[[16]]~~.
21. (Currently amended) The clamping unit of claim ~~[[19 or 20]]~~ 28, wherein the ~~[[cylindrical]]~~ recess ~~[[12]]~~ in the secondary piston ~~[[7]]~~ is cylindrical and has an end which is distal to the primary piston ~~[[2]]~~ and closed by an end piece ~~[[49]]~~ so that a pressure space ~~[[51]]~~ is formed in the secondary piston ~~[[7]]~~.

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22. (Currently amended) The clamping unit of claim 21, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, wherein the further pressure space [(10) between the secondary piston (7) and the cylinder (1)] is hydraulically blockable during [(the)] closing and opening movements of an injection molding tool of the injection molding machine.
23. (Currently amended) The clamping unit of claim 21 [(or 22)], wherein the pressure space [(51)] in the secondary piston [(7)] is decompressible during [(the)] a closing movement of an injection molding tool and connectable to a pressure medium source [(27)] for [(the)] an opening movement of an injection molding tool.
24. (Currently amended) The clamping unit of claim [(19 or 20)] 28, wherein the [(cylindrical)] recess [(12)] in the secondary piston [(7)] is cylindrical and has an end which is distal to the primary piston [(2)] and open, and [(that)] further comprising at least [(an)] one auxiliary cylinder [(56, 56')] is/are] provided on the fixed [(44)] platen [(and/or)] or the moving [(16)] platen.

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25. (Currently amended) The clamping unit of claim 24, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, wherein the first pressure space ~~[[6]]~~ is hydraulically blockable for ~~[[the]]~~ a closing movement of an injection molding tool, ~~[[the]]~~ said further pressure space ~~[[10]]~~ is connectable to a pressure medium source ~~[[27]]~~ and ~~]] while the auxiliary [[cylinder(s) (56, 56') can be]] is idle.~~
26. (Currently amended) The clamping unit of claim 24, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, wherein the first pressure space ~~[[6]]~~ is hydraulically blockable for ~~[[the]]~~ a closing movement of an injection molding tool, ~~[[and the]]~~ said auxiliary ~~cylinder(s) (56, 56') as well as the and said~~ further pressure space ~~[[10]]~~ are connectable to a pressure medium source ~~[[27]]~~.

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27. (Currently amended) The clamping unit of [[one of the claims 24 to 26]] claim 24, wherein the secondary piston has a first section sliding on an inner wall of the cylinder and demarcating the first pressure space on a side facing the primary piston, said secondary piston further including a second section extending in prolongation of the first section and having a diameter which is smaller than an inner diameter of the cylinder so that a further pressure space in the form of an annular gap is defined between the cylinder and the secondary piston, wherein the first pressure space [(6)] is hydraulically blockable for [[the]] an opening movement of an injection molding tool, and the further pressure space [(10)] is decompressible, and [[that]] wherein the auxiliary cylinder(s) (56, 56') are cylinder is so disposed and hydraulically actuatable that [the] a greater surface of the piston(s) (58, 58') is/are subject to a piston of the auxiliary cylinder is acted upon by a pressure medium.
28. (New) A clamping unit for a two-platen injection molding machine, comprising:
- a fixed platen;
 - a moving platen; and
 - a hydraulic device for operating the moving platen, said hydraulic device including a cylinder having a first pressure space with a pressure medium, a primary piston which includes at least one piston rod constructed to float in the pressure medium in the first pressure space, and a secondary piston axially movable in the cylinder and having a recess in which the piston rod of the primary piston is movable, said primary and secondary pistons having opposing sides to define confronting contact surfaces which can be brought to impact one another, wherein the primary piston has a side which is distal to the secondary piston and has a second piston rod defined by a diameter which is smaller than a diameter of the first piston rod, said further piston rod projecting beyond the cylinder.

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